AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A method of reducing depolarization of a wireless signal passing through an antenna radome, comprising:
determining an angle of incidence of the signal relative to the radome;
from said determined angle of incidence, determining at least one offset to signal depolarization ~~attributable to~~ induced by the radome; and
applying the at least one offset to the signal to reduce depolarization of the signal.

2. (original) The method of claim 1, wherein the applying is based on at least one pointing angle of the antenna.

3. (original) The method of claim 1, further comprising applying the offset to the signal based on a desired polarization angle of the signal.

4. (original) The method of claim 1, further comprising:
storing the at least one offset in a memory; and
retrieving the at least one offset from the memory based on at least one pointing angle of the antenna.

5. (original) The method of claim 1, wherein applying the offset comprises interpolating among a plurality of offsets.

6. (original) The method of claim 1, wherein determining at least one offset is performed relative to a selected signal frequency.

7. (original) The method of claim 1, wherein determining at least one offset comprises using an angle of signal incidence to determine a radome transmission coefficient.

8. (original) The method of claim 1, wherein determining at least one offset comprises minimizing a cross-polarization discrimination ratio (XPD) in accordance with

$$XPD = \left|\frac{E'_{co}}{E'_{cross}}\right| = \frac{\tau_{TM}\cos(\alpha-\psi)[E_x\cos\alpha + E_y\sin\alpha] + \tau_{TE}\sin(\alpha-\psi)[-E_y\cos\alpha + E_x\sin\alpha]}{\tau_{TE}\cos(\alpha-\psi)[E_y\cos\alpha - E_x\sin\alpha] + \tau_{TM}\sin(\alpha-\psi)[E_x\cos\alpha + E_y\sin\alpha]}$$

where τ_{TE} and τ_{TM} are radome transmission coefficients, α is an angle of incidence and ψ is a desired polarization angle.

9. (currently amended) The method of claim 1, wherein determining at least one offset comprises ~~determining at least one of an amplitude offset and a phase offset~~ minimizing a cross-polarization discrimination ratio (1/XPD) in accordance with

$$XPD = \left|\frac{E'_{co}}{E'_{cross}}\right| = \frac{\tau_{TM}\cos(\alpha-\psi)[E_x\cos\alpha + E_y\sin\alpha] + \tau_{TE}\sin(\alpha-\psi)[-E_y\cos\alpha + E_x\sin\alpha]}{\tau_{TE}\cos(\alpha-\psi)[E_y\cos\alpha - E_x\sin\alpha] + \tau_{TM}\sin(\alpha-\psi)[E_x\cos\alpha + E_y\sin\alpha]}$$

where τ_{TE} and τ_{TM} are radome transmission coefficients, α is an angle of incidence and ψ is a desired polarization angle.

10. (original) The method of claim 1, wherein applying the offset comprises combining at least one of an amplitude offset and a phase offset with the signal.

11. (original) The method of claim 1, wherein determining at least one offset comprises resolving radiated field components of the signal into RHCP and LHCP components.

12. (original) The method of claim 11, wherein determining at least one offset further comprises determining excitations e_x and e_y at ports of the antenna in accordance with

$$\frac{e_x}{e_y} = \frac{j\tau_{TM}\sin\alpha + \tau_{TE}\cos a}{\tau_{TE}\sin\alpha + j\tau_{TE}\cos a}$$

where where τ_{TE} and τ_{TM} are radome transmission coefficients and α is an angle of incidence.

13. (original) The method of claim 1, further comprising converting between a radio frequency of the signal and an intermediate frequency using one of a downconverter and an upconverter.

14. (currently amended) A method of compensating for depolarization of a signal passing through an antenna radome, comprising:

dividing the signal into a plurality of polarized signals; and

applying, to at least one of the polarized signals, at least one offset predetermined~~ to compensate for depolarization attributable to~~ based on a difference between a tranverse magnetic (TM) transmission coefficient and a transverse electric (TE) coefficient of the radome, the at least one offset configured to cancel depolarization attributable to the difference.

15. (original) The method of claim 14, wherein the polarized signals include at least one circularly polarized signal.

16. (original) The method of claim 14, wherein applying at least one offset comprises determining an offset to one of a differential amplitude between the polarized signals and a differential phase between the polarized signals.

17. (currently amended) The method of claim 14, further comprising using a ~~transmission coefficient of the radome~~ the TM and TE transmission coefficients to determine a cross-polarization ratio (XPD); and

minimizing an inverse of the cross-polarization ratio to determine the at least one offset.

18. (original) The method of claim 14, wherein applying is performed periodically during movement of the antenna.

19. (original) The method of claim 14, wherein applying at least one offset comprises interpolating among a plurality of predetermined amplitude offsets to determine the at least one offset.

20. (original) The method of claim 14, wherein applying at least one offset comprises interpolating among a plurality of predetermined phase offsets to determine the at least one offset.

21. (original) The method of claim 14, wherein the applying is performed on one side of the radome to compensate for depolarization on another side of the radome.

22. (original) The method of claim 14, wherein the applying is performed on one side of the radome to compensate for depolarization on the same side of the radome.

23. (original) The method of claim 14, further comprising determining a transmission coefficient of the radome for an angle of incidence and frequency of the signal at the radome.

24. (original) The method of claim 14, further comprising using at least one offset value stored in a memory to determine a differential amplitude and phase.

25. (currently amended) An apparatus for compensating for depolarization of a wireless signal attributable to passage of the signal through an antenna radome, the signal entering the apparatus as a plurality of oppositely polarized signals, the apparatus comprising:

an applicator circuit including a plurality of phase shifters having settings configured to shift phases of the oppositely polarized signals to generate polarization of the wireless signal at a desired polarization angle; and

a processor in communication with the applicator circuit and configured to determine at least one offset to the polarized signals that compensates for depolarization ~~attributable to~~ induced by the radome; ~~and an applicator circuit~~

the processor further configured to adjust one or more of the phase shifter settings to apply the at least one offset to at least one of the polarized signals to reduce depolarization of the wireless signal.

26. (original) The apparatus of claim 25, wherein the processor is further configured to determine the offset based on at least one transmission coefficient of the radome.

27. (original) The apparatus of claim 25, wherein the processor is further configured to use a desired plane of polarization of the wireless signal to determine the offset.

28. (original) The apparatus of claim 25, wherein the applicator circuit comprises at least one phase shifter and at least one attenuator in series with the phase shifter.

29. (original) The apparatus of claim 25, wherein the applicator circuit comprises a pair of phase shifters and a variable power divider connected with the phase shifters.

30. (original) The apparatus of claim 29, wherein the variable power divider comprises a three decibel hybrid, a second pair of phase shifters connected with the hybrid, and a power divider connected with the second pair of phase shifters.

31. (currently amended) An antenna system comprising:

a radome through which a wireless signal is configured to pass;

a polarizer circuit configured to divide the wireless signal into oppositely polarized signals;

a processor configured to determine at least one offset to at least one of the polarized signals ~~that compensates for depolarization attributable to~~ based on a

difference between transverse electric and transverse magnetic transmission coefficients (τ_{TE} and τ_{TM}) of the radome; and

an applicator circuit configured to apply the at least one offset to at least one of the polarized signals to cancel depolarization attributable to the difference.

32. (cancelled)

33. (original) The antenna system of claim 31, wherein the processor is further configured to use a desired plane of polarization of the wireless signal to determine the offset.

34. (original) The antenna system of claim 31, wherein the applicator circuit comprises at least one phase shifter and at least one attenuator in series with the phase shifter.

35. (original) The antenna system of claim 31, further configured to transmit the wireless signal.

36. (original) The antenna system of claim 31, further configured to receive the wireless signal.

37. (currently amended) A polarization controller for controlling polarization of a wireless signal passing through an antenna having a radome, the controller comprising a signal divider that divides the signal into oppositely polarized signals, an adjustment circuit that ~~applies a variable~~ varies a differential phase shift to the polarized signals in accordance with a desired linear polarization plane orientation angle, and at least one processor configured to:

determine an angle of incidence of the wireless signal relative to the radome;

determine, from the determined angle of incidence, at least one offset to cancel an imbalance between transverse electric (TE) and transverse magnetic (TM)

components of the wireless signal ~~depolarization attributable to~~ induced by the radome; and

control the adjustment circuit so as to vary the differential phase shift to apply the offset to ~~the signal~~ the polarized signals.

38. (new) A method of reducing depolarization of a wireless signal passing through an antenna radome, comprising:

determining an angle of incidence of the signal relative to the radome;

from said determined angle of incidence, determining at least one offset to signal depolarization attributable to the radome; and

applying the offset to the signal to reduce depolarization of the signal;

wherein determining at least one offset comprises minimizing a cross-polarization discrimination ratio (XPD) in accordance with

$$XPD = \left|\frac{E'_{co}}{E'_{cross}}\right| = \frac{\tau_{TM}\cos(\alpha-\psi)[E_x\cos\alpha + E_y\sin\alpha] + \tau_{TE}\sin(\alpha-\psi)[-E_y\cos\alpha + E_x\sin\alpha]}{\tau_{TE}\cos(\alpha-\psi)[E_y\cos\alpha - E_x\sin\alpha] + \tau_{TM}\sin(\alpha-\psi)[E_x\cos\alpha + E_y\sin\alpha]}$$

where τ_{TE} and τ_{TM} are radome transmission coefficients, α is an angle of incidence and ψ is a desired polarization angle.

39. (new) A method of reducing depolarization of a wireless signal passing through an antenna radome, comprising:

determining an angle of incidence of the signal relative to the radome;

from said determined angle of incidence, determining at least one offset to signal depolarization attributable to the radome; and

applying the offset to the signal to reduce depolarization of the signal;

wherein determining at least one offset comprises:

resolving radiated field components of the signal into RHCP and LHCP components; and

determining excitations e_x and e_y at ports of the antenna in accordance with

$$\frac{e_x}{e_y} = \frac{j\tau_{TM}\sin\alpha + \tau_{TE}\cos a}{\tau_{TE}\sin\alpha + j\tau_{TE}\cos a}$$

where where τ_{TE} and τ_{TM} are radome transmission coefficients and α is an angle of incidence.

40. (new) An apparatus for compensating for depolarization of a wireless signal attributable to passage of the signal through an antenna radome, the signal entering the apparatus as a plurality of oppositely polarized signals, the apparatus comprising:

a processor configured to determine at least one offset to the polarized signals that compensates for depolarization attributable to the radome; and

an applicator circuit configured to apply the offset to at least one of the polarized signals, the applicator circuit comprising a pair of phase shifters and a variable power divider connected with the phase shifters;

wherein the variable power divider comprises a three decibel hybrid, a second pair of phase shifters connected with the hybrid, and a power divider connected with the second pair of phase shifters.